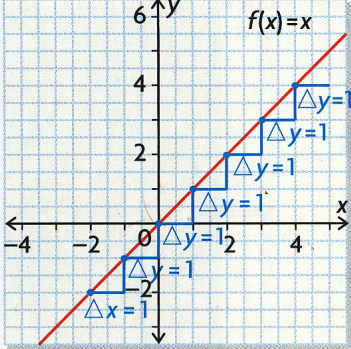
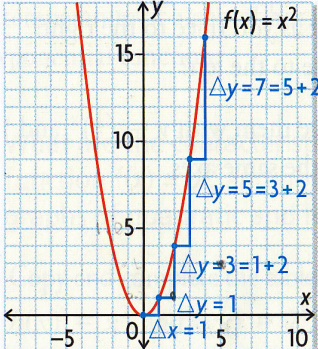
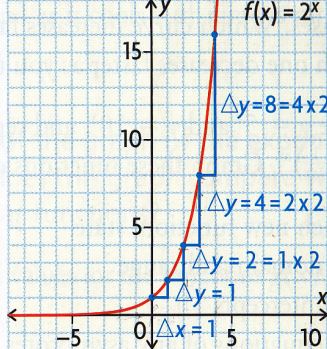


6.5B Exploring Exponential Growth and Decay

Remember:

Linear	Quadratic	Exponential
Linear functions have constant first differences.	Quadratic functions have first differences that are related by an addition pattern. As a result, their second differences are constant.	Exponential functions have first differences that are related by a multiplication pattern. As a result, their second differences are not constant.
		

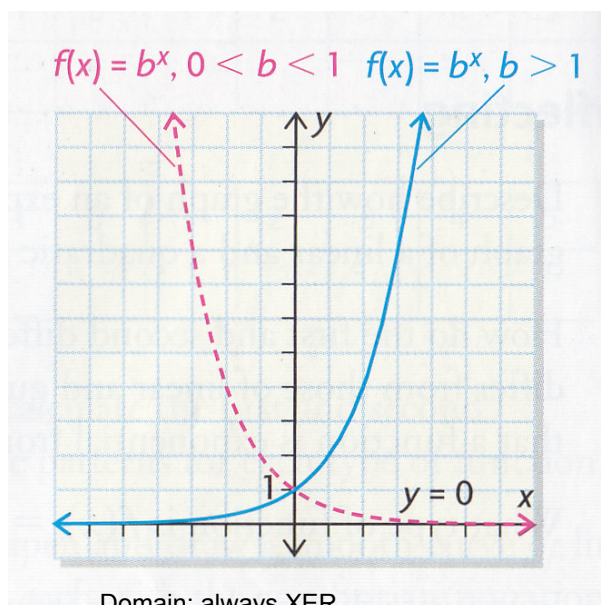
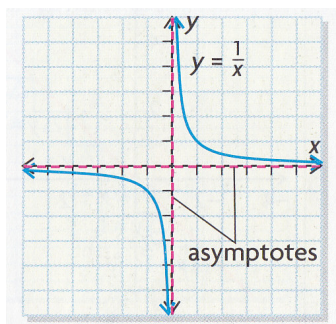
The exponential function $f(x) = b^x$ has the following characteristics:

$$b > 0 \text{ and } b \neq 0$$

If $b > 1$, bigger the number, the fast the growth

If $0 < b < 1$, smaller the number, the faster the decay

The function has a horizontal **ASYMPTOTE**, which is the x axis.



Domain: always XER

Range: set of all positive real numbers

Asymptote: A line that a curve approaches but never reaches on some part of the domain

Graph the following function

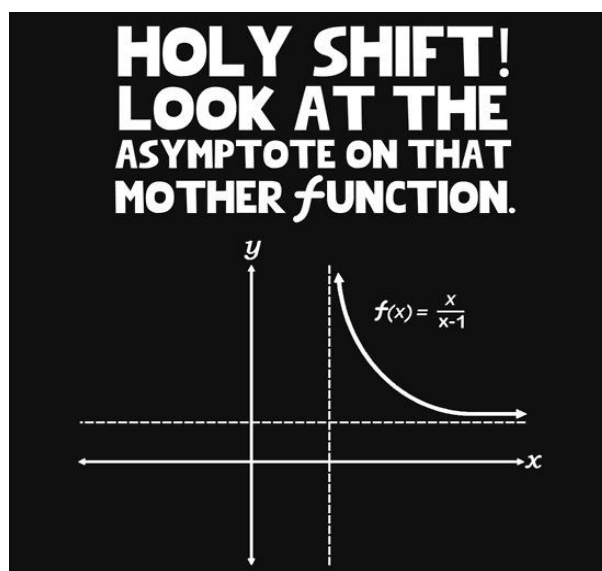
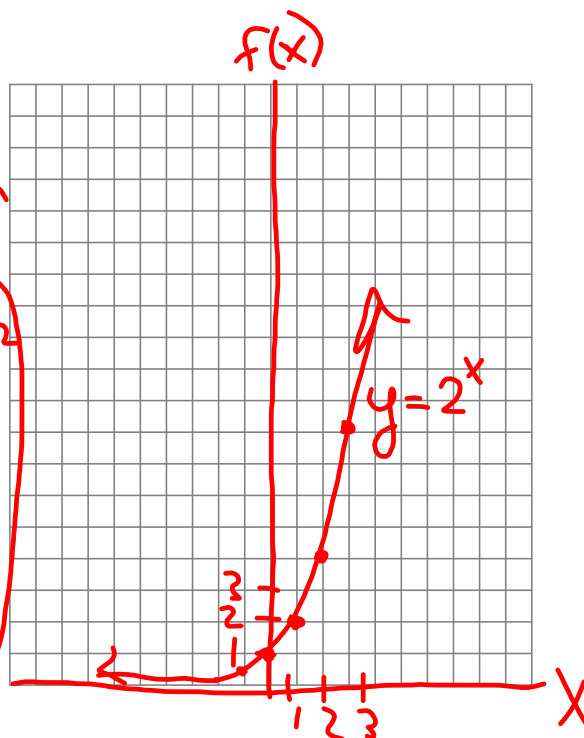
$$y = 2^x$$

x	y
-3	0.125
-2	0.25
-1	0.5
0	1
1	2
2	4
3	8

1st

Pattern

0.125
 0.25 $\times 2$
 0.5 $\times 2$
 1 $\times 2$
 2 $\times 2$
 4 $\times 2$



Assigned Work:
 p423 #1, 2, 3abc, 4